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09/127.644	07/31/98	SCHOD		1525-837

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J GEORG SEKA
TOWNSEND AND TOWNSEND CREW
EIGHTH FLOOR
TWO EMBARCADERO CENTER
SAN FRANCISCO CA 94111-3834

TAMAI, EXAMINER

ABEUNT

PAPER NUMBER

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DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/127,644

Applicant(s)

Schob

Examiner

Karl Tamai

Group Art Unit

2834



☒ Responsive to communication(s) filed on Jul 27, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1035 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1 and 3-22 is/are pending in the application

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1, 3-10, 14, and 17-21 is/are rejected.

☒ Claim(s) 11-13, 15, 16, and 22 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☒ The drawing(s) filed on Jul 31, 1998 is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s) _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the magnetic journal having a spatially modulated magnet distributed on a disc or ring shaped rotor with a plurality of recesses and projections must be shown or the features canceled from the claims. No new matter should be entered.

Specification

2. A substitute specification filed on 7/27/2000 has been entered into the file wrapper.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 9 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The specification does not have a full, clear, concise, and exact written description of a magnetic journal having spatially modulated magnets distributed on a disc or ring shaped rotor with a plurality of recesses and projections of claim 9.

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5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 3-7 are vague and indefinite because they depend from a canceled claim.

For the purposes of advancing prosecution on the merits, the examiner will assume that claims 3-7 depend from the amended claim 1.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 4, 8, 9, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman. Nichols teaches a magnetically levitated ring shaped rotor which the stator having axially aligned levitating magnets and circumferentially disposed field windings 40 to rotate the rotor. Nichols teaches unipolar rotor flux in the ferromagnetic, reluctance poles of the rotor which close the magnetic circuit with the stator bearing magnets 38. Nichols teaches control windings 42 on the stator to control the unipolar magnetic bearing flux. Nichols teaches every aspect of the invention, except permanent magnets on the rotor creating unipolar magnetic

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bearing flux and an additional stator(or two) in a plane parallel with bearing plane. Lyman teaches an axially oriented permanent magnet 31 on the rotor to provide magnetic bearing flux across the air gap with the stator. Lyman teaches the rotor can be either disk shaped inside the ring shaped stator or the rotor can be ring shaped outside the stator. Lyman teaches a plurality of stators in parallel to provide magnetic bearing support to the rotor. Lyman does not teach a plurality of magnets on the arranged on the disk shaped rotor. Nichols teaches the permanent magnet producing the bearing flux being four circumferentially, spatially modulated magnets 38a rather than a single permanent magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols with the permanent magnet on the rotor as in Lyman to efficiently support a rotor with a large moment of inertia, and with a first and second stator in parallel with the bearing plane because Lyman teaches a plurality of bearing disks provide additional support to rotor.

9. Claims 1, 3, 4, 5, 8, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller(US 4,668,885). Shimamoto teaches annular rings on the rotor and stator with a unipolar flux journal, where the stator includes a means to produce a field 30 for the rotation of the rotor. Shimamoto teaches control windings 82, 84, 86, 88 to control the magnet journal flux. Shimamoto teaches an axially magnetized permanent magnets 62/64 on the stator having control windings 88 and axially magnetized permanent magnets 70/72 on the rotor, where the permanent magnets 62/64 and 70/72 are positioned on opposite sides of a rotor ring 56 and

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stator disk 48. Shimamoto teaches rings 66 and 68 which are parallel to the bearing plane at 46.

Shimamoto teaches a disc shaped motor stator 16 which is parallel to the bearing plane.

Shimamoto does not teach the magnets being spatially modulated. Scheller teaches a plurality of spatially modulated magnets 10 are equivalent to an annular ring magnet. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto with spatially modulated magnets because Scheller teaches a plurality of spatially modulated magnets are simple and easy to manufacture.

10. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of Machino. Shimamoto and Scheller teach every aspect of the invention, except the permanent magnets on the rotor and stator being both radially aligned and alternately aligned(one axially/one radially magnetized). Machino teaches the equivalence of permanent magnets being both axially aligned(figure 1a), both radially aligned (figure 1b) and alternately aligned(figure 3 showing the stator magnet being radially magnetized with the rotor magnet being axially aligned). It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller with the bearing magnets on the rotor and stator being both radially aligned or alternately aligned because Machino teaches the equivalence of the magnetization of the bearings being axially, radially or alternatively magnetized, and it would have an obvious selection of equivalents to choose between different magnetization for the bearing.

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11. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman, in further view of German Patent 945,183('183). Nichols and Lyman teach every aspect of the invention except, a rotatable drive which can be magnetically coupled to the rotor. '183 teaches a magnetic couple drive with a radial magnetic couple 20 and an axial magnetic couple 11 which are equivalent to a motor driven 28 rotor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols and Lyman with the magnetic couple drive because '183 teaches the equivalence of a magnetic couple drive and a motor drive, such that it would have been an obvious design choice to select between known equivalents, and because a mechanical drive allows the drive source to be positioned away from the rotor.

12. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols and Lyman, in further view of Schoeb. Nichols and Lyman teach every aspect of the invention, except the use of the motor in biological liquids and in a bio-reactor. Schoeb teaches the use of motors in biological liquids and in a bio-reactor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Nichols and Lyman for use in biological liquids to allow the motors to operate as blood pumps, as in Schoeb.

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13. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of German Patent 945,183('183). Shimamoto and Scheller teach every aspect of the invention except, a rotatable drive which can be magnetically coupled to the rotor. '183 teaches a magnetic couple drive with a radial magnetic couple 20 and an axial magnetic couple 11 which are equivalent to a motor driven 28 rotor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller with the magnetic couple drive because '183 teaches the equivalence of a magnetic couple drive and a motor drive, such that it would have been an obvious design choice to select between known equivalents, and because a mechanical drive allows the drive source to be positioned away from the rotor.

14. Claims 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimamoto and Scheller, in further view of Schoeb. Shimamoto and Scheller teach every aspect of the invention, except the use of the motor in biological liquids and in a bio-reactor. Schoeb teaches the use of motors in biological liquids and in a bio-reactor. It would have been obvious to a person skilled in the art at the time of the invention to construct the motor of Shimamoto and Scheller, for use in biological liquids to allow the motors to operate as blood pumps, as in Schoeb.

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Allowable Subject Matter

15. Claims 11-13, 15, 16, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

16. Applicant's arguments filed July 27, 2000 have been fully considered but they are not persuasive. The Applicant's argument that Nichols and Lyman do not teach spatial modulation in the circumferential direction on the rotor is not persuasive. Nichols teaches recesses on the rotor which provides spatial modulation of the magnetic flux. Also, the rejection is made on the combined teaching of Nichols and Lyman. Nichols teaches the journal magnets on the stator are spatially modulated, so it would have been obvious to use the same or similar spatially modulated magnets on the rotor to provide a strong magnetic journal between the rotor and stator, as in Lyman. The Applicant's argument regarding the combined teaches of Nichols and Lyman is not persuasive. Nichols teaches the unipolar rotor journaled to the stator. Lyman merely teaches that including a permanent magnet on the rotor. It is obvious to person skilled in the art, that the inclusion of the magnet on the rotor increases the journal flux between the stator and the levitated rotor.

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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl I.E. Tamai whose telephone number is (703) 305-7066. The examiner can be normally contacted on Monday through Friday from 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Nestor Ramirez, can be reached at (703)308-1371.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist at (703) 308-0956.



Karl I Tamai
PATENT EXAMINER
October 5, 2000

**Karl Tamai
Patent Examiner
Technology Center 2800**